Munich Cancer Registry

- Survival
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- *Deutsch*

ICD-10 C86: Other T/NK-cell lymphomas

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	247
Diseases	247
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m

Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
at Klinikum Grosshadern/IBE
Marchioninistr. 15
Munich, 81377
Germany

https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/base/bC86__E-ICD-10-C86-Other-T-NK-cell-lymphomas-incidence-and-mortality.pdf

Index of figures and tables

Global Statements about the statistics on the Internet −
Baseline Statistics (grey button), **Survival** (red button)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.69 million inhabitants, account for the frequency of cancer diseases[##] and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases[###] are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, December 2021

[#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.65 million to 4.10 in 2002, and to 4.69 million in 2007).

[##] Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

ICD-10 codes (ICD-10 2016) used for specifying cancer site

Code	Description
C86.-	Other specified types of T/NK-cell lymphoma
C86.0	Extranodal NK/T-cell lymphoma, nasal type
C86.1	Hepatosplenic T-cell lymphoma
C86.2	Enteropathy-type (intestinal) T-cell lymphoma
C86.3	Subcutaneous panniculitis-like T-cell lymphoma
C86.4	Blastic NK-cell lymphoma
C86.5	Angioimmunoblastic T-cell lymphoma
C86.6	Primary cutaneous CD30-positive T-cell proliferations

INCIDENCE

Table 1

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (ALL PATIENTS)

Year of diagnosis	All cases n	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	2	0.0	8.8	50.0	50.0
1999	2	0.0	8.9	100.0	100.0
2000	2	0.0	8.5	50.0	50.0
2001	3	0.0	7.8	66.7	66.7
2002	10	5.3	7.4	90.0	100.0 #
2003	6	4.0	6.8	100.0	100.0
2004	9	2.9	6.6	77.8	88.9
2005	18	7.7	6.4	66.7	100.0
2006	15	10.4	7.0	80.0	93.3
2007	9	9.2	5.8	77.8	88.9 #
2008	11	10.3	5.5	72.7	100.0
2009	17	12.5	4.5	82.4	94.1
2010	13	12.8	5.1	84.6	100.0
2011	14	14.5	5.6	64.3	92.9
2012	13	14.6	5.5	84.6	92.3
2013	12	15.4	6.1	83.3	100.0
2014	16	15.7	5.7	50.0	87.5
2015	19	17.3	2.8	68.4	100.0
2016	15	18.0	3.8	60.0	100.0
2017	10	19.0	2.6	50.0	100.0
2018	10	19.5	3.6	40.0	100.0
2019	15	20.3	5.0	40.0	100.0
2020	6	20.6	0.0	66.7	100.0 ##
1998-2020	247	20.6	8.8	69.2	95.5

247 cases diagnosed 1998-2020 are related to a total of 247 patients. Currently, in 77 (31.2 %) of these 247 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 60 / 9 / 8 (24.3 % / 3.6 % / 3.2 %) patients exist having 2 / 3 / 4+ malignancies.

\# The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

\## Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 10 cases has been diagnosed, of which 19.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.6 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (MALES)

Year of diagnosis	Males n	Males %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %	
1998	1	50.0	0.0	6.1			
1999	2	100.0	0.0	6.1	100.0	100.0	
2000	2	100.0	0.0	5.4	50.0	50.0	
2001	1	33.3	0.0	3.9	100.0	100.0	
2002	5	50.0	9.1	3.2	100.0	100.0	#
2003	2	33.3	7.7	3.3	100.0	100.0	
2004	4	44.4	5.9	3.4	50.0	75.0	
2005	10	55.6	11.1	2.6	70.0	100.0	
2006	12	80.0	12.8	2.9	83.3	91.7	
2007	4	44.4	11.6	2.2	100.0	100.0	#
2008	4	36.4	12.8	2.2	75.0	100.0	
2009	6	35.3	13.2	2.4	83.3	100.0	
2010	6	46.2	15.3	2.5	66.7	100.0	
2011	7	50.0	16.7	2.7	57.1	85.7	
2012	7	53.8	16.4	3.0	71.4	85.7	
2013	8	66.7	17.3	3.3	75.0	100.0	
2014	8	50.0	16.9	3.8	75.0	100.0	
2015	13	68.4	18.6	2.3	61.5	100.0	
2016	11	73.3	20.4	3.2	63.6	100.0	
2017	6	60.0	22.7	5.0	66.7	100.0	
2018	5	50.0	23.4	7.1	40.0	100.0	
2019	7	46.7	22.9	10.0	42.9	100.0	
2020	4	66.7	23.0	0.0	75.0	100.0	##
1998-2020	135	54.7	23.0	6.1	69.6	95.6	

135 cases diagnosed 1998-2020 are related to a total of 135 patients. Currently, in 41 (30.4 %) of these 135 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 33 / 4 / 4 (24.4 % / 3.0 % / 3.0 %) patients exist having 2 / 3 / 4+ malignancies.

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 5 cases has been diagnosed, of which 23.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.1 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (FEMALES)

Year of diagnosis	Females n	Females %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %	
1998	1	50.0	0.0	12.3	100.0	100.0	
1999	0						
2000	0						
2001	2	66.7	0.0	12.4	50.0	50.0	
2002	5	50.0	0.0	12.6	80.0	100.0	#
2003	4	66.7	0.0	11.2	100.0	100.0	
2004	5	55.6	0.0	10.6	100.0	100.0	
2005	8	44.4	4.0	11.2	62.5	100.0	
2006	3	20.0	7.1	12.3	66.7	100.0	
2007	5	55.6	6.1	10.3	60.0	80.0	#
2008	7	63.6	7.5	9.5	71.4	100.0	
2009	11	64.7	11.8	7.2	81.8	90.9	
2010	7	53.8	10.3	8.6	100.0	100.0	
2011	7	50.0	12.3	9.8	71.4	100.0	
2012	6	46.2	12.7	9.1	100.0	100.0	
2013	4	33.3	13.3	10.5	100.0	100.0	
2014	8	50.0	14.5	8.6	25.0	75.0	
2015	6	31.6	15.7	3.6	83.3	100.0	
2016	4	26.7	15.1	4.5	50.0	100.0	
2017	4	40.0	14.4	0.0	25.0	100.0	
2018	5	50.0	14.7	0.0	40.0	100.0	
2019	8	53.3	17.3	0.0	37.5	100.0	
2020	2	33.3	17.9	0.0	50.0	100.0	##
1998-2020	112	45.3	17.9	12.3	68.8	95.5	

112 cases diagnosed 1998-2020 are related to a total of 112 patients. Currently, in 36 (32.1 %) of these 112 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 27 / 5 / 4 (24.1 % / 4.5 % / 3.6 %) patients exist having 2 / 3 / 4+ malignancies.

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 5 cases has been diagnosed, of which 14.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 0.0 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	1	1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1
1999	2		0.2		0.1		0.2		0.2	
2000	2		0.2		0.1		0.1		0.2	
2001	1	2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1
2002	5	5	0.3	0.3	0.2	0.1	0.2	0.1	0.3	0.2
2003	2	4	0.1	0.2	0.0	0.1	0.1	0.1	0.2	0.2
2004	4	5	0.2	0.3	0.2	0.1	0.2	0.1	0.2	0.2
2005	10	8	0.5	0.4	0.3	0.2	0.4	0.3	0.5	0.4
2006	12	3	0.6	0.1	0.4	0.0	0.5	0.1	0.6	0.1
2007	4	5	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2
2008	4	7	0.2	0.3	0.1	0.2	0.1	0.2	0.2	0.3
2009	6	11	0.3	0.5	0.2	0.2	0.2	0.3	0.3	0.4
2010	6	7	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3
2011	7	7	0.3	0.3	0.2	0.1	0.3	0.2	0.3	0.2
2012	7	6	0.3	0.3	0.2	0.1	0.2	0.1	0.3	0.2
2013	8	4	0.3	0.2	0.2	0.1	0.2	0.1	0.3	0.1
2014	8	8	0.3	0.3	0.2	0.1	0.2	0.2	0.3	0.2
2015	13	6	0.5	0.2	0.3	0.1	0.4	0.1	0.5	0.2
2016	11	4	0.5	0.2	0.2	0.1	0.3	0.1	0.4	0.1
2017	6	4	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1
2018	5	5	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2
2019	7	8	0.3	0.3	0.2	0.1	0.2	0.2	0.3	0.2
2020	4	2	0.2	0.1	0.1	0.0	0.1	0.0	0.2	0.0
1998-2020	135	112	0.3	0.2	0.2	0.1	0.2	0.1	0.3	0.2

The computation of the incidence measures includes all cancers, irrespective of first or subsequent malignancy.

Table 3

Age distribution parameters by year of diagnosis (ALL PATIENTS)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	2	73.0	20.9	58.3	87.8	58.3	58.3	73.0	87.8	87.8
1999	2	63.5	3.6	60.9	66.0	60.9	60.9	63.5	66.0	66.0
2000	2	68.8	5.5	64.9	72.8	64.9	64.9	68.8	72.8	72.8
2001	3	63.7	18.9	41.9	75.9	41.9	41.9	73.2	75.9	75.9
2002	10	70.6	13.1	46.5	87.7	53.5	62.8	67.7	82.1	86.5
2003	6	74.5	13.4	56.9	90.7	56.9	60.0	77.7	83.8	90.7
2004	9	62.2	22.8	9.1	80.8	9.1	59.1	70.2	76.8	80.8
2005	18	60.1	17.7	17.9	80.1	34.5	48.8	63.8	75.3	79.5
2006	15	62.5	15.8	32.5	84.9	33.3	50.5	68.4	75.2	77.1
2007	9	67.5	12.2	47.7	81.1	47.7	59.3	71.5	77.4	81.1
2008	11	63.4	15.4	25.0	78.9	48.4	60.2	65.6	74.2	77.2
2009	17	68.5	17.4	29.7	86.7	43.2	55.2	76.1	80.7	86.7
2010	13	61.7	18.7	25.5	86.2	28.7	52.4	64.9	75.3	83.1
2011	14	63.9	15.7	23.5	81.5	43.6	60.5	69.3	75.9	77.5
2012	13	67.9	13.2	45.9	89.8	49.4	59.4	67.9	79.8	83.6
2013	12	67.4	17.7	28.8	90.3	37.9	63.9	72.1	78.1	81.2
2014	16	74.5	9.5	50.1	88.0	63.0	70.4	75.5	78.6	86.9
2015	19	66.6	12.5	47.5	89.2	49.0	55.7	68.6	78.1	83.7
2016	15	67.3	9.2	51.8	85.0	54.8	58.2	69.3	72.7	75.8
2017	10	63.0	11.5	47.6	79.2	48.0	52.9	63.8	71.9	77.5
2018	10	70.5	12.7	48.9	87.6	51.6	58.3	73.2	78.8	85.3
2019	15	69.8	14.5	36.6	88.0	40.7	67.8	72.0	81.1	82.9
2020	6	68.0	12.2	48.7	85.2	48.7	62.3	69.3	73.3	85.2
1998–2020	247	66.6	14.8	9.1	90.7	47.6	59.3	70.2	77.1	83.0

Table 3a

Age distribution parameters by year of diagnosis (MALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	1	87.8		87.8	87.8	87.8	87.8	87.8	87.8	87.8
1999	2	63.5	3.6	60.9	66.0	60.9	60.9	63.5	66.0	66.0
2000	2	68.8	5.5	64.9	72.8	64.9	64.9	68.8	72.8	72.8
2001	1	73.2		73.2	73.2	73.2	73.2	73.2	73.2	73.2
2002	5	70.4	16.0	46.5	87.7	46.5	67.7	67.8	82.1	87.7
2003	2	77.7	0.9	77.1	78.4	77.1	77.1	77.7	78.4	78.4
2004	4	48.0	28.1	9.1	72.5	9.1	27.8	55.3	68.3	72.5
2005	10	61.1	18.2	17.9	80.1	31.0	61.4	63.8	75.3	78.0
2006	12	59.1	15.6	32.5	77.1	33.3	49.7	61.5	72.2	76.9
2007	4	60.5	13.1	47.7	77.4	47.7	50.4	58.5	70.6	77.4
2008	4	70.9	5.1	64.8	77.2	64.8	67.7	70.8	74.1	77.2
2009	6	58.0	21.0	29.7	80.7	29.7	43.2	58.4	77.4	80.7
2010	6	66.4	15.0	51.3	86.2	51.3	52.4	62.8	83.1	86.2
2011	7	59.5	20.1	23.5	81.5	23.5	43.6	61.3	77.5	81.5
2012	7	62.3	13.1	45.9	83.6	45.9	49.4	61.7	72.1	83.6
2013	8	63.6	19.2	28.8	78.6	28.8	52.3	72.1	76.5	78.6
2014	8	73.7	7.4	63.0	86.9	63.0	68.0	74.8	76.9	86.9
2015	13	62.8	12.0	47.5	83.7	49.0	50.9	61.9	69.7	79.5
2016	11	67.8	10.0	51.8	85.0	55.0	58.2	70.6	74.3	75.8
2017	6	65.7	10.1	47.6	75.7	47.6	63.1	68.1	71.9	75.7
2018	5	67.1	10.1	54.4	76.5	54.4	58.3	71.9	74.5	76.5
2019	7	64.4	18.0	36.6	82.3	36.6	40.7	71.8	75.3	82.3
2020	4	63.1	10.6	48.7	73.3	48.7	55.5	65.2	70.7	73.3
1998-2020	135	64.2	14.9	9.1	87.8	45.9	55.0	67.7	75.3	79.5

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	1	58.3		58.3	58.3	58.3	58.3	58.3	58.3	58.3
2001	2	58.9	24.0	41.9	75.9	41.9	41.9	58.9	75.9	75.9
2002	5	70.9	11.4	60.6	85.2	60.6	62.8	64.6	81.2	85.2
2003	4	72.9	16.9	56.9	90.7	56.9	58.4	71.9	87.3	90.7
2004	5	73.5	9.1	59.1	80.8	59.1	70.2	76.8	80.4	80.8
2005	8	58.8	18.1	34.5	79.5	34.5	42.4	60.8	75.0	79.5
2006	3	76.4	8.0	69.0	84.9	69.0	69.0	75.2	84.9	84.9
2007	5	73.2	8.9	59.3	81.1	59.3	71.5	73.1	80.8	81.1
2008	7	59.1	18.0	25.0	78.9	25.0	48.4	61.5	74.2	78.9
2009	11	74.3	12.6	53.2	86.7	55.2	61.4	77.3	85.9	86.7
2010	7	57.7	21.6	25.5	75.8	25.5	28.7	69.6	75.3	75.8
2011	7	68.3	9.3	51.0	76.2	51.0	60.5	71.2	75.9	76.2
2012	6	74.5	10.8	59.4	89.8	59.4	67.9	75.0	80.2	89.8
2013	4	74.8	13.3	61.4	90.3	61.4	63.9	73.7	85.8	90.3
2014	8	75.4	11.6	50.1	88.0	50.1	73.4	76.4	82.7	88.0
2015	6	75.0	9.7	60.2	89.2	60.2	71.3	75.2	79.0	89.2
2016	4	65.7	7.7	54.8	72.7	54.8	61.0	67.7	70.5	72.7
2017	4	58.9	13.9	48.5	79.2	48.5	50.7	53.9	67.1	79.2
2018	5	73.9	15.2	48.9	87.6	48.9	71.3	78.8	83.0	87.6
2019	8	74.5	9.3	59.1	88.0	59.1	69.0	73.4	82.0	88.0
2020	2	77.9	10.3	70.6	85.2	70.6	70.6	77.9	85.2	85.2
1998–2020	112	69.5	14.1	25.0	90.7	51.0	60.3	71.7	79.4	85.4

Table 4

Age distribution by 5-year age group and sex for period 2007-2020

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24	1	0.6	0.6	1	1.0	1.0			0.0
25-29	5	2.8	3.3	2	2.1	3.1	3	3.6	3.6
30-34	0	0.0	3.3			3.1			3.6
35-39	2	1.1	4.4	2	2.1	5.2			3.6
40-44	3	1.7	6.1	3	3.1	8.3			3.6
45-49	12	6.7	12.8	9	9.4	17.7	3	3.6	7.1
50-54	13	7.2	20.0	7	7.3	25.0	6	7.1	14.3
55-59	9	5.0	25.0	4	4.2	29.2	5	6.0	20.2
60-64	21	11.7	36.7	15	15.6	44.8	6	7.1	27.4
65-69	17	9.4	46.1	9	9.4	54.2	8	9.5	36.9
70-74	38	21.1	67.2	20	20.8	75.0	18	21.4	58.3
75-79	31	17.2	84.4	15	15.6	90.6	16	19.0	77.4
80-84	13	7.2	91.7	6	6.3	96.9	7	8.3	85.7
85+	15	8.3	100.0	3	3.1	100.0	12	14.3	100.0
All ages	180	100.0		96	100.0		84	100.0	

Table 5

Age-specific incidence and proportion of all cancers
for period 2007-2020

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4						
5- 9						
10-14						
15-19						
20-24	1		0.0		0.2	
25-29	2	3	0.1	0.1	0.2	0.3
30-34						
35-39	2		0.1		0.1	
40-44	3		0.1		0.1	
45-49	9	3	0.3	0.1	0.2	0.0
50-54	7	6	0.3	0.2	0.1	0.0
55-59	4	5	0.2	0.2	0.0	0.0
60-64	15	6	0.8	0.3	0.1	0.0
65-69	9	8	0.6	0.4	0.0	0.0
70-74	20	18	1.3	1.0	0.1	0.1
75-79	15	16	1.2	1.1	0.1	0.1
80-84	6	7	0.8	0.7	0.0	0.0
85+	3	12	0.6	1.2	0.0	0.1
All ages	96	84			0.1	0.1
Incidence						
Raw			0.3	0.3		
WS			0.2	0.1		
ES			0.2	0.2		
BRD-S			0.3	0.2		

The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

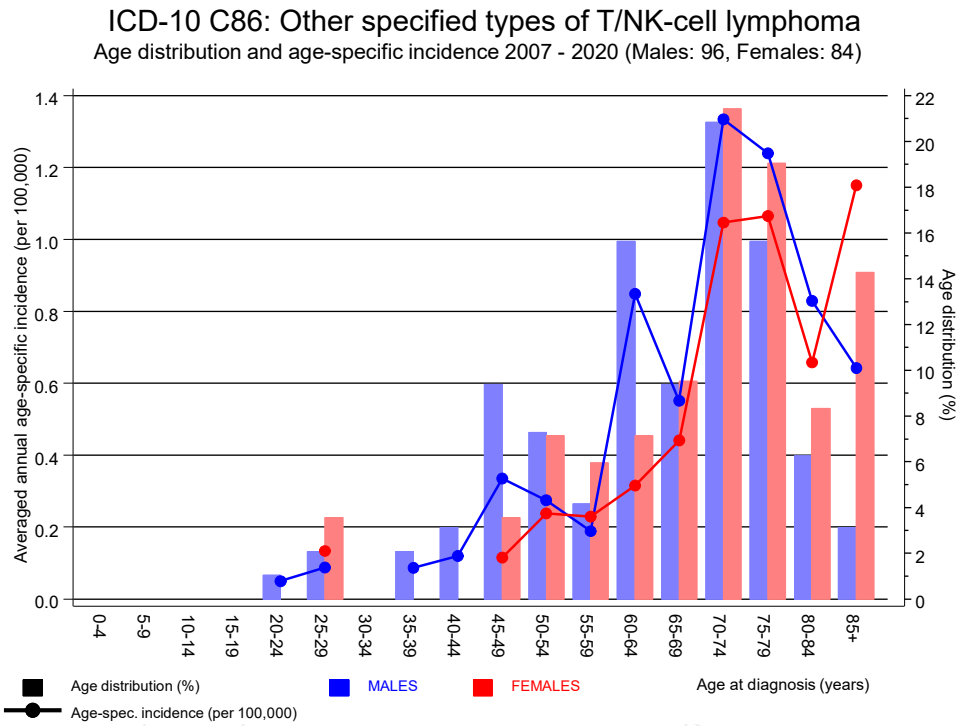


Figure 6. Age distribution (males: mean=64.8 yrs, median=68.3 yrs; females: mean=70.2 yrs, median=72.2 yrs) and age-specific incidence.

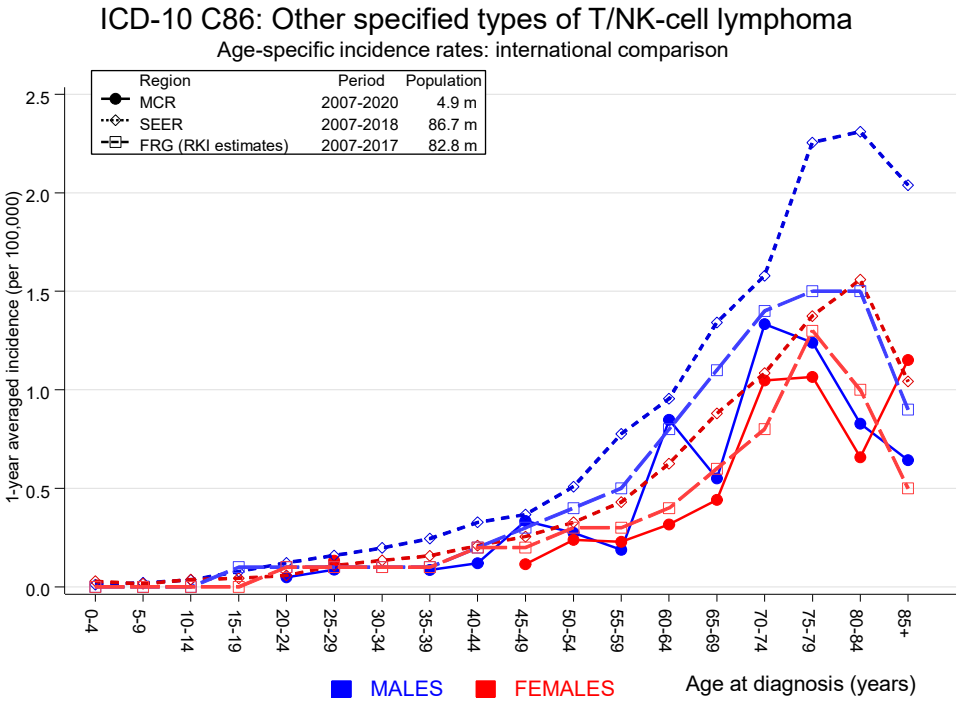


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Estimated age-specific patient population of Germany, latest update: 16 March 2021. German Centre for Cancer Registry Data, Robert Koch Institute (RKI), based on data of the population based cancer registries. http://www.krebsdaten.de. Last access: 08/17/2021
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 21 Regs Research Data, released April 2021, based on the November 2020 submission. http://www.seer.cancer.gov.

Table 7a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2020

MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C16	Stomach	1	0.2	5.5	0.1	30.8	25.0	
C19–C20	Rectum	1	0.2	4.1	0.1	22.7	23.0	
C61	Prostate	3	1.3	2.3	0.5	6.7	51.7	
C67	Bladder	1	0.2	4.6	0.1	25.5	23.8	
Not observed		0	2.8	0.0	0.0	1.3	-84.7	
All further malignancies		6	4.7	1.3	0.5	2.8	38.8	

Patients	134
Median age at next malignancy (years)	74.9
Person-years	328
Mean observation time (years)	2.4
Median observation time (years)	1.1

The occurrence of further specified malignancy is statistically significant.

Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2020

FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C17	Small intestine	1	0.0	50.3	1.3	280.1	#	30.2	
C50	Breast	7	1.1	6.6	2.7	13.6	#	183.2	
C51	Vulva	1	0.0	25.5	0.6	142.2		29.6	
C64	Kidney	1	0.1	12.2	0.3	68.2		28.3	
C82–C85	NHL	5	0.1	36.6	11.9	85.3	#	150.0	
Not observed		0	2.2	0.0	0.0	1.7		-66.7	
All further malignancies		15	3.5	4.3	2.4	7.1	#	354.7	

Patients	111
Median age at next malignancy (years)	73.2
Person-years	324
Mean observation time (years)	2.9
Median observation time (years)	1.3

The occurrence of further specified malignancy is statistically significant.

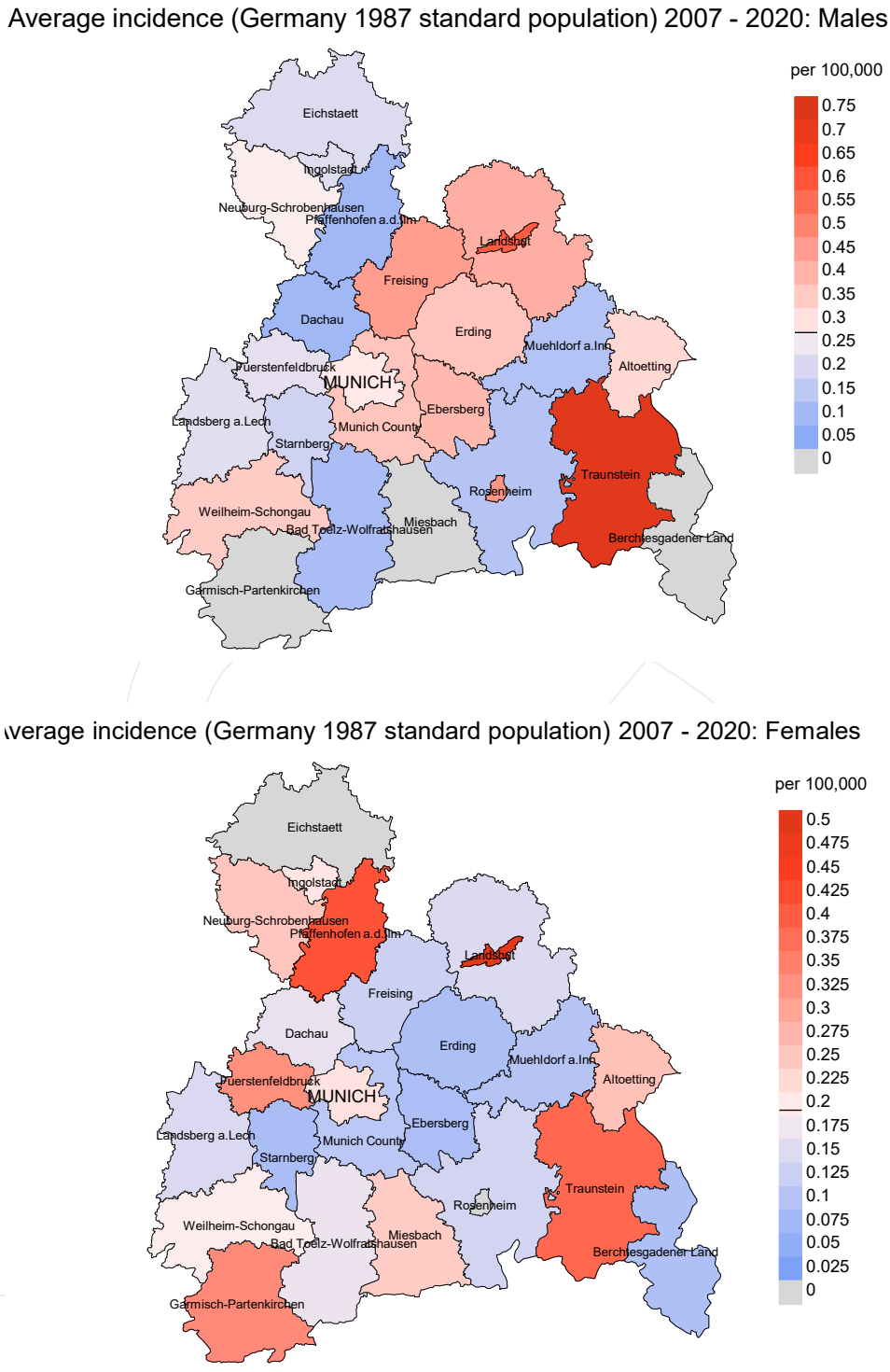
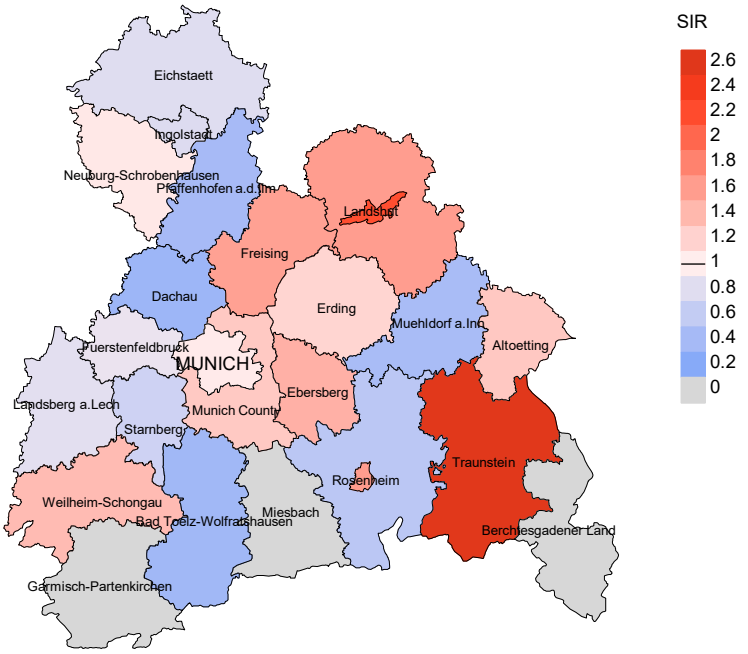


Figure 8a. Map of cancer incidence (german standard population) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.3/100,000 WS N=96, females 0.2/100,000 WS N=84).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 1 women were identified with newly diagnosed other T/NK-cell lymphomas. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.1/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 0.7/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

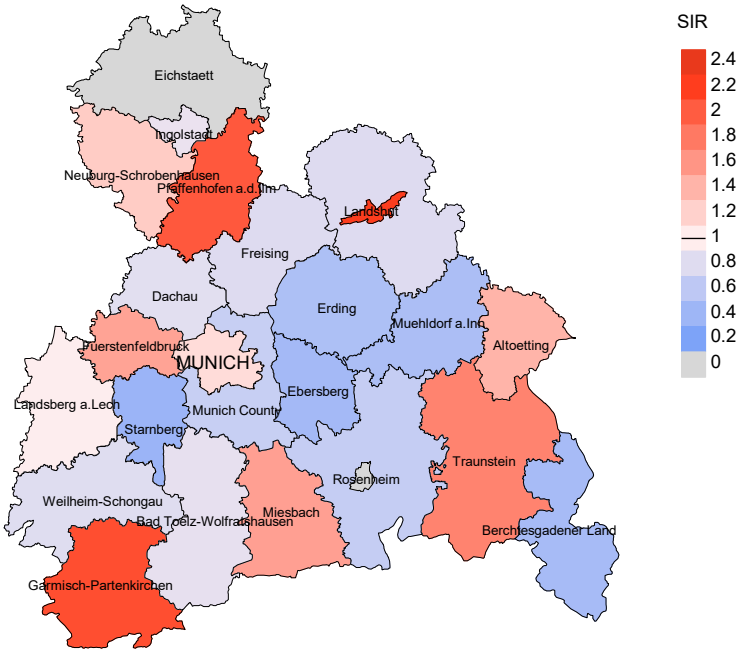


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=96, females N=84).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 1 women were identified with newly diagnosed other T/NK-cell lymphomas. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.44. Though, the value of this parameter may vary with an underlying probability of 99% between 0.00 and 3.27, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status,
and deaths among the annual cohorts

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	2	50.0	1	50.0	
1999	2	100.0	2	100.0	100.0
2000	2	50.0	1	50.0	100.0
2001	3	66.7	2	66.7	100.0
2002	10	100.0	9	90.0	88.9
2003	6	100.0	6	100.0	100.0
2004	9	88.9	7	77.8	71.4
2005	18	100.0	12	66.7	100.0
2006	15	93.3	12	80.0	91.7
2007	9	88.9	7	77.8	85.7
2008	11	100.0	8	72.7	100.0
2009	17	94.1	14	82.4	100.0
2010	13	100.0	11	84.6	90.9
2011	14	92.9	9	64.3	100.0
2012	13	92.3	11	84.6	90.9
2013	12	100.0	10	83.3	90.0
2014	16	87.5	8	50.0	100.0
2015	19	100.0	13	68.4	92.3
2016	15	100.0	9	60.0	88.9
2017	10	100.0	5	50.0	60.0
2018	10	100.0	4	40.0	25.0
2019	15	100.0	6	40.0	83.3
2020	6	100.0	4	66.7	100.0
1998–2020	247	95.5	171	69.2	90.1

Table 9b

Annual cohorts of incident cancers and deaths,
and cases deceased within the same year of being diagnosed with cancer

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Deaths in same year n	Prop. deaths in same year %
1998	2	1	1	50.0
1999	2			
2000	2			
2001	3	1		
2002	10	6	5	50.0
2003	6	2		
2004	9	6	1	11.1
2005	18	5	4	22.2
2006	15	7	3	20.0
2007	9	11	1	11.1
2008	11	4		
2009	17	14	10	58.8
2010	13	9	5	38.5
2011	14	4		
2012	13	14	3	23.1
2013	12	11	4	33.3
2014	16	13	3	18.8
2015	19	12	3	15.8
2016	15	10	3	20.0
2017	10	12		
2018	10	12		
2019	15	11	1	6.7
2020	6	5	1	16.7
1998–2020	247	170	48	19.4

Table 9c

Annual cohorts of deaths, and proportion of cancer-related and non-cancer-related deaths

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	1	100.0		
1999				
2000				
2001	1	100.0		100.0
2002	6	83.3	16.7	100.0
2003	2	100.0		100.0
2004	6	66.7	33.3	100.0
2005	5	100.0		100.0
2006	7	57.1	42.9	100.0
2007	11	100.0		100.0
2008	4	100.0		100.0
2009	14	71.4	28.6	100.0
2010	9	88.9	11.1	88.9
2011	4	100.0		100.0
2012	14	78.6	21.4	100.0
2013	11	90.9	9.1	100.0
2014	13	61.5	38.5	75.0
2015	12	83.3	16.7	91.7
2016	10	80.0	20.0	100.0
2017	12	66.7	33.3	91.7
2018	12	41.7	58.3	85.7
2019	11	54.5	45.5	71.4
2020	5	80.0	20.0	75.0
1998-2020	170	75.9	24.1	93.4

Table 10a

Medians of age at death according to the grouping in Table 9
MALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998					
1999					
2000					
2001	1	63.3	63.3		63.3
2002	3	67.9	67.9		67.9
2003	2	78.5	78.5		78.5
2004	2	78.3	77.5	79.1	78.3
2005	5	72.9	72.9		72.9
2006	4	75.7	69.8	75.7	75.7
2007	8	64.0	64.0		64.3
2008	1	73.0	73.0		73.0
2009	7	73.9	74.7	73.9	73.9
2010	5	72.3	66.6	86.2	73.6
2011	1	57.5	57.5		57.5
2012	4	77.5	82.9	57.3	77.5
2013	6	70.0	70.0		70.0
2014	8	74.4	71.1	79.9	73.4
2015	7	71.3	73.7	61.0	73.7
2016	7	69.7	68.9	83.6	69.7
2017	6	74.2	74.9	73.5	73.5
2018	10	74.7	75.5	74.7	77.5
2019	5	79.2	82.4	64.1	67.6
2020	2	72.1	72.1		64.6
1998-2020	94	72.7	71.3	74.8	72.6

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 10b

Medians of age at death according to the grouping in Table 9
FEMALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	1	58.4	58.4		
1999					
2000					
2001					
2002	3	76.7	71.2	76.7	76.7
2003					
2004	4	83.7	80.9	86.5	86.5
2005					
2006	3	61.1	64.8	61.1	64.8
2007	3	79.0	79.0		79.0
2008	3	73.7	73.7		77.5
2009	7	78.1	76.7	85.8	78.1
2010	4	63.1	63.1		63.1
2011	3	78.9	78.9		80.2
2012	10	78.3	73.0	86.9	76.8
2013	5	81.7	80.9	81.7	81.7
2014	5	77.2	67.9	79.8	76.7
2015	5	77.9	73.5	77.9	77.9
2016	3	60.1	60.1		60.1
2017	6	77.3	74.3	81.1	77.3
2018	2	71.5	56.5	86.5	
2019	6	78.7	77.7	79.7	77.7
2020	3	70.9	76.5	60.3	65.6
1998-2020	76	77.0	74.2	81.1	77.7

By 2018, Bavarians' life expectancy at birth is estimated at 79.3 years for boys and 83.8 years for girls.

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 11a

Mortality measures (cancer-related death) and mortality-incidence-index
by year of death
MALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998									
1999									
2000									
2001	1	0.1	1.00	0.0	0.94	0.1	0.78	0.1	0.67
2002	3	0.2	0.60	0.1	0.62	0.1	0.58	0.2	0.62
2003	2	0.1	1.00	0.1	1.40	0.1	1.16	0.1	0.76
2004	1	0.1	0.25	0.0	0.10	0.0	0.19	0.1	0.35
2005	5	0.3	0.50	0.1	0.36	0.2	0.45	0.3	0.52
2006	2	0.1	0.17	0.1	0.14	0.1	0.15	0.1	0.18
2007	8	0.4	2.00	0.2	2.03	0.3	1.95	0.4	1.86
2008	1	0.0	0.25	0.0	0.22	0.0	0.22	0.0	0.21
2009	4	0.2	0.67	0.1	0.47	0.1	0.58	0.2	0.64
2010	4	0.2	0.67	0.1	0.63	0.1	0.64	0.2	0.61
2011	1	0.0	0.14	0.0	0.15	0.0	0.18	0.0	0.14
2012	3	0.1	0.43	0.0	0.22	0.1	0.29	0.1	0.45
2013	6	0.3	0.75	0.1	0.72	0.2	0.77	0.2	0.75
2014	6	0.3	0.75	0.1	0.89	0.2	0.81	0.2	0.75
2015	6	0.3	0.46	0.1	0.31	0.2	0.36	0.2	0.44
2016	5	0.2	0.45	0.1	0.54	0.2	0.50	0.2	0.47
2017	5	0.2	0.83	0.1	0.66	0.1	0.75	0.2	0.77
2018	4	0.2	0.80	0.1	0.79	0.1	0.77	0.2	0.85
2019	3	0.1	0.43	0.0	0.19	0.1	0.28	0.1	0.38
2020	2	0.1	0.50	0.0	0.35	0.1	0.39	0.1	0.46
1998-2020	72	0.2	0.53	0.1	0.46	0.1	0.50	0.2	0.54

Table 11b

Mortality measures (cancer-related death) and mortality-incidence-index
by year of death
FEMALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	1	0.1	1.00	0.0	1.00	0.1	1.00	0.1	1.00
1999									
2000									
2001									
2002	2	0.1	0.40	0.0	0.35	0.1	0.36	0.1	0.42
2003									
2004	3	0.2	0.60	0.0	0.56	0.1	0.51	0.1	0.47
2005									
2006	2	0.1	0.67	0.1	1.24	0.1	1.03	0.1	0.89
2007	3	0.1	0.60	0.0	0.51	0.1	0.53	0.1	0.53
2008	3	0.1	0.43	0.0	0.21	0.1	0.27	0.1	0.33
2009	6	0.3	0.55	0.1	0.49	0.1	0.50	0.2	0.54
2010	4	0.2	0.57	0.1	0.53	0.1	0.55	0.2	0.55
2011	3	0.1	0.43	0.0	0.37	0.1	0.42	0.1	0.48
2012	8	0.3	1.33	0.1	1.55	0.2	1.45	0.3	1.35
2013	4	0.2	1.00	0.1	0.84	0.1	0.87	0.1	0.81
2014	2	0.1	0.25	0.0	0.47	0.1	0.37	0.1	0.31
2015	4	0.2	0.67	0.1	0.86	0.1	0.77	0.1	0.68
2016	3	0.1	0.75	0.1	0.68	0.1	0.69	0.1	0.67
2017	3	0.1	0.75	0.0	0.45	0.1	0.52	0.1	0.67
2018	1	0.0	0.20	0.0	0.31	0.0	0.31	0.0	0.22
2019	3	0.1	0.38	0.0	0.42	0.1	0.38	0.1	0.43
2020	2	0.1	1.00	0.0	0.96	0.0	0.95	0.1	1.17
1998-2020	57	0.1	0.51	0.0	0.48	0.1	0.49	0.1	0.49

Table 12

Age distribution of age at death (cancer-related) for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29	1	0.9	0.9			0.0	1	2.0	2.0
30-34	1	0.9	1.9			0.0	1	2.0	4.1
35-39	0	0.0	1.9			0.0			4.1
40-44	2	1.9	3.7	2	3.4	3.4			4.1
45-49	5	4.7	8.4	4	6.9	10.3	1	2.0	6.1
50-54	4	3.7	12.1	2	3.4	13.8	2	4.1	10.2
55-59	6	5.6	17.8	3	5.2	19.0	3	6.1	16.3
60-64	14	13.1	30.8	9	15.5	34.5	5	10.2	26.5
65-69	11	10.3	41.1	7	12.1	46.6	4	8.2	34.7
70-74	19	17.8	58.9	10	17.2	63.8	9	18.4	53.1
75-79	18	16.8	75.7	9	15.5	79.3	9	18.4	71.4
80-84	12	11.2	86.9	7	12.1	91.4	5	10.2	81.6
85+	14	13.1	100.0	5	8.6	100.0	9	18.4	100.0
All ages	107	100.0		58	100.0		49	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007–2020
(**incl. multiple malignancies**)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29		1			0.0	0.33		1.0
30-34		1			0.0	1.00		0.6
35-39								
40-44	2		0.1	0.67			0.3	
45-49	4	1	0.1	0.44	0.0	0.33	0.3	0.1
50-54	2	2	0.1	0.29	0.1	0.33	0.1	0.1
55-59	3	3	0.1	0.75	0.1	0.60	0.1	0.1
60-64	9	5	0.5	0.60	0.3	0.83	0.1	0.1
65-69	7	4	0.4	0.78	0.2	0.50	0.1	0.1
70-74	10	9	0.7	0.50	0.5	0.50	0.1	0.1
75-79	9	9	0.7	0.60	0.6	0.56	0.1	0.1
80-84	7	5	1.0	1.17	0.5	0.71	0.1	0.1
85+	5	9	1.1	1.67	0.9	0.75	0.1	0.1
All ages	58	49					0.1	0.1
Mortality								
Raw			0.2	0.60	0.1	0.58		
WS			0.1	0.54	0.1	0.55		
ES			0.1	0.58	0.1	0.56		
BRD-S			0.2	0.60	0.1	0.57		
PYLL-70								
per 100,000			1.1		0.8			
ES			0.9		0.7			
AYLL-70			11.2		13.1			

Table 14a

Further malignancies in deaths in period 1998–2020
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C18	Colon	2	7.4	1	50.0	1	50.0		
C19–C20	Rectum	2	7.4	1	50.0			1	50.0
C32	Larynx	1	3.7			1	100.0		
C43	Malign. melanoma	1	3.7	1	100.0				
C44	Skin others	5	18.5	3	60.0			2	40.0
C60	Penis	1	3.7	1	100.0				
C61	Prostate	9	33.3	6	66.7	1	11.1	2	22.2
C67	Bladder	1	3.7					1	100.0
C73	Thyroid	1	3.7	1	100.0				
C81	Hodgkin lymphoma	1	3.7	1	100.0				
C82–C85	NHL	1	3.7					1	100.0
C91–C96	Leukaemia	2	7.4	2	100.0				
All further malignancies		27	100.0	17	63.0	3	11.1	7	25.9

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 14b

Further malignancies in deaths in period 1998–2020
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C18	Colon	1	5.6			1	100.0		
C33–C34	Lung	1	5.6	1	100.0				
C44	Skin others	3	16.7	2	66.7	1	33.3		
C50	Breast	5	27.8	4	80.0	1	20.0		
C55,C57	Fem. genitals un	1	5.6	1	100.0				
C56	Ovary	1	5.6	1	100.0				
C64	Kidney	1	5.6					1	100.0
C81	Hodgkin lymphoma	2	11.1	2	100.0				
C82–C85	NHL	3	16.7					3	100.0
All further malignancies		18	100.0	11	61.1	3	16.7	4	22.2

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**First primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29		1			0.0	0.33		1.1
30-34		1			0.0	1.00		0.6
35-39								
40-44	2		0.1	0.67			0.4	
45-49	4	1	0.1	0.50	0.0	0.33	0.3	0.1
50-54	1	2	0.0	0.14	0.1	0.33	0.0	0.1
55-59	3	3	0.1	1.00	0.1	0.60	0.1	0.1
60-64	6	2	0.3	0.67	0.1	1.00	0.1	0.0
65-69	3	4	0.2	0.50	0.2	0.57	0.0	0.1
70-74	4	6	0.3	0.44	0.3	0.50	0.0	0.1
75-79	7	8	0.6	0.70	0.5	0.80	0.1	0.1
80-84	6	3	0.8	1.20	0.3	0.75	0.1	0.0
85+	4	6	0.9	2.00	0.6	0.75	0.1	0.1
All ages	40	37					0.1	0.1
Mortality								
Raw			0.1	0.60	0.1	0.62		
WS			0.1	0.51	0.0	0.56		
ES			0.1	0.56	0.1	0.58		
BRD-S			0.1	0.60	0.1	0.60		
PYLL-70								
per 100,000			0.9		0.7			
ES			0.7		0.6			
AYLL-70			13.3		14.3			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**Single primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29		1			0.0	0.33		1.1
30-34		1			0.0	1.00		0.6
35-39								
40-44	2		0.1	0.67			0.4	
45-49	4	1	0.1	0.50	0.0	0.50	0.3	0.1
50-54	1	2	0.0	0.14	0.1	0.33	0.0	0.1
55-59	3	3	0.1	1.00	0.1	0.60	0.1	0.1
60-64	6	2	0.3	0.67	0.1	1.00	0.1	0.1
65-69	3	3	0.2	0.60	0.2	0.50	0.0	0.1
70-74	4	6	0.3	0.44	0.3	0.75	0.0	0.1
75-79	6	8	0.5	0.60	0.5	0.80	0.1	0.1
80-84	5	3	0.7	1.00	0.3	0.75	0.1	0.0
85+	3	5	0.6	1.50	0.5	0.63	0.1	0.1
All ages	37	35					0.1	0.1
Mortality								
Raw			0.1	0.56	0.1	0.65		
WS			0.1	0.49	0.0	0.60		
ES			0.1	0.53	0.1	0.62		
BRD-S			0.1	0.56	0.1	0.64		
PYLL-70								
per 100,000			0.9		0.7			
ES			0.7		0.6			
AYLL-70			13.3		15.2			

* See corresponding tables with multiple malignancies.

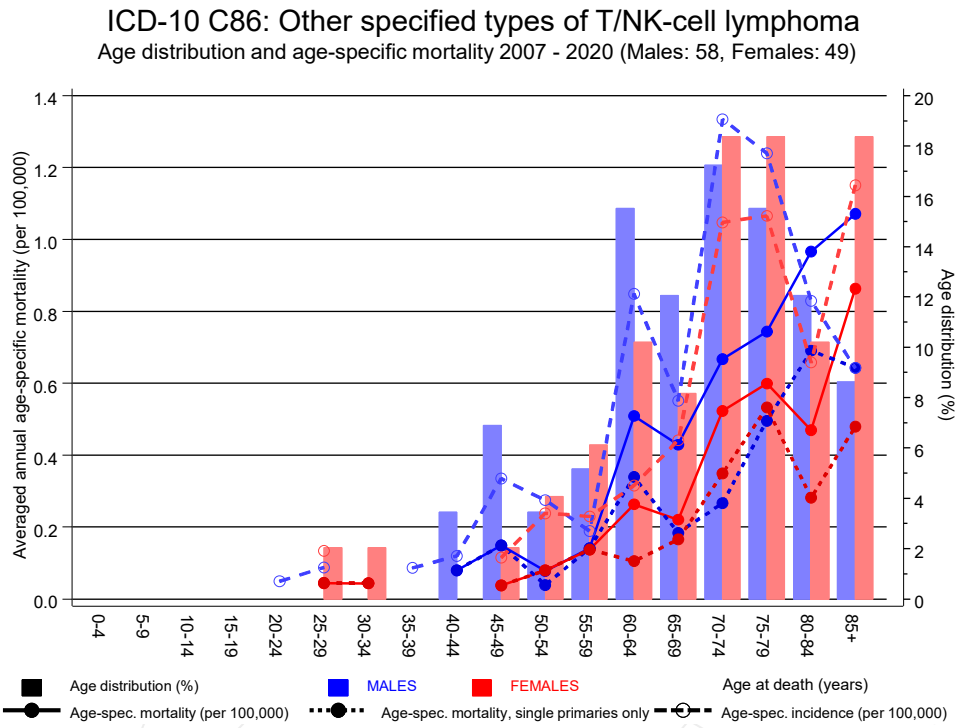


Figure 17. Distribution of age at death (bars; males: mean=67.2 yrs, median=68.7 yrs; females: mean=70.2 yrs, median=71.2 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at other T/NK-cell lymphomas-related death (see Table 10) should be considered.

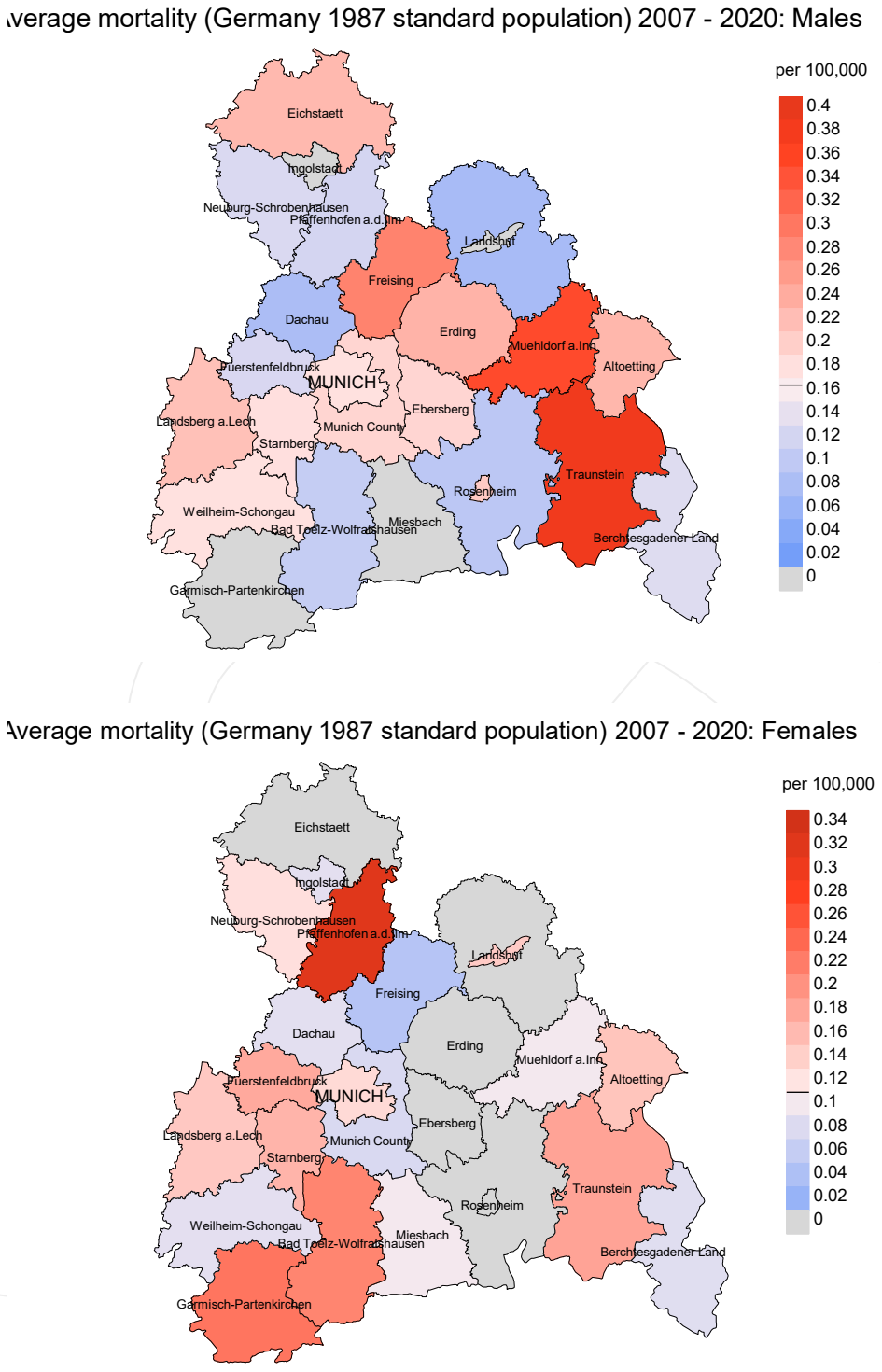
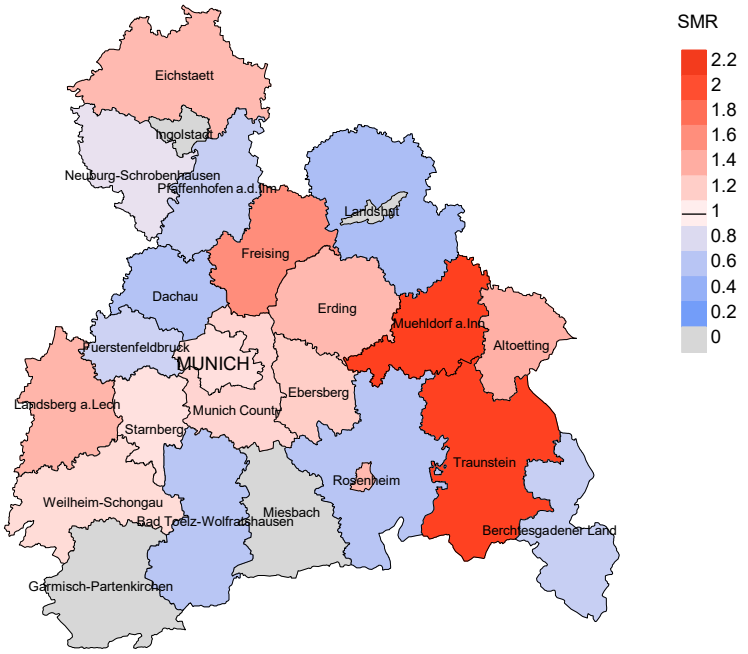


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.2/100,000 WS N=58, females 0.1/100,000 WS N=49).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 0 women died from other T/NK-cell lymphomas. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.0/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 0.0/100,000.

Standardized mortality ratio (SMR) 2007 - 2020: Males



Standardized mortality ratio (SMR) 2007 - 2020: Females

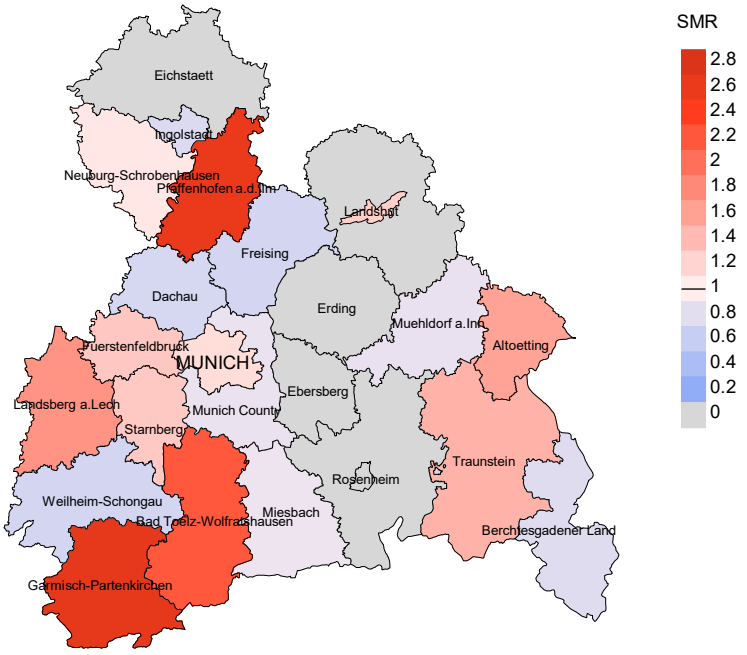


Figure 18b. Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=58, females N=49).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 0 women died from other T/NK-cell lymphomas. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.00. Though, the value of this parameter may vary with an underlying probability of 99% between 0.00 and 4.03, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases, where applicable. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. **All multiple primaries included**

   The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. **First singular primary** (no information about other prior or synchronous malignancy)

   The mortality statistic describes the cancer-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. **Single primary** (no information about other prior, syn- or metachronous malignancy)

   The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head&neck and lung).

The ratio of mortality and incidence (mortality-to-incidence ratio, **MIR**, **MI-Index**) is a statistical index that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MIR. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

MCR	Munich Cancer Registry (Tumorregister München)
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
SEER	Surveillance, Epidemiology, and End Results (USA)
DCO	Death certificate only
BRD-S	German (FRG) standard population
ES	European standard population (old)
WS	World standard population
SIR	Standardized incidence ratio
CI	Confidence interval
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
SMR	Standardized mortality ratio
MI-index	Ratio of mortality to incidence, MIR
FRG	Federal Republic of Germany

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